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| 10/522,947 | 02/02/2005 | Koichi Suzuki | 03500.017493 | 8395 |

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

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| EXAMINER |
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CROUSE, BRETT ALAN

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| ART UNIT | PAPER NUMBER |
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1774

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06/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/522,947 | Applicant(s) SUZUKI ET AL. | |
| | Examiner Brett A. Crouse | Art Unit 1774 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>20060313;20050202</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 5 and 8-12 are rejected under 35 U.S.C. 102(e) as being anticipated by

Igarashi et al., WO 03/007658 hereinafter known as Igarashi.

Igarashi teaches:

As to claims 1, 4, 5 and 8:

Page 2, line 23 through page 5, line 24, general formula (1) and (2), teach a central aromatic ring, which includes benzene, and which is additionally substituted with one or more condensed aryl groups, or condensed or uncondensed heteroaryl groups in which the substituents do not bond to each other to form a ring. Preferred substituents include naphthyl, phenanthryl, anthryl, fluoranthenyl, pyrenyl, and perylenyl groups.

Pages 20 through 30, compounds 1-1 through 1-95, present example compounds of formula (1). Compounds (1-52) and (1-67) meet the limitations of claims 1 and 5 of the instant invention. Additionally, the compounds provide examples of pyrene and fluoranthrene as required by claims 4 and 8.

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As to claims 9-12:

Page 31, line 20 through page 32, line 3, teaches a light-emitting device which uses the compounds of formula (1) as a light-emitting material, host material, electron-injecting material, electron transport material, hole injection material, and/or hole transport material. The passage additionally teaches that the light-emitting device comprises a light-emitting layer and a plurality of layers between a positive and negative electrode. The light-emitting layer or at least one of the plurality of layers comprises compounds of formula (1).

Claims 1, 5 and 9-12 are rejected under 35 U.S.C. 102(a) as being anticipated by Suzuki et al., JP 2003-109764 hereinafter known as Suzuki.

Suzuki teaches:

As to claims 1 and 5:

Paragraph [0018], formula [I], teaches compounds useful in the light-emitting layer of organic light emitting device. At least two of $R_1 - R_6$ of formula [I] are replaced by substituent groups.

Paragraphs [0042]-[0043], formula [VII], teach substituted or unsubstituted fluorene as a preferred substituent for $R_1 - R_6$ of formula [I].

Paragraphs [0089]-[0092], provide example compounds of formula [I]. Attention is directed to compound 7, which meets the limitations of formulae [1] and [2] of the instant invention.

As to claims 9-12:

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Paragraph [0017], teaches an electroluminescent device structure comprising an anode, cathode and at least one layer therebetween. The at least one layer comprises a light-emitting layer. Said light-emitting layer comprises a compound of formula [I].

Paragraphs [0096]-[0104], figures 1-6, teach various device structures comprising an anode, cathode and at least one layer therebetween. The at least one layer comprises a light-emitting layer.

Paragraph [0110], teaches that compounds of formula [I] can be used in the electron transport or luminous layers of a light-emitting device.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al., JP 2003-109764 hereinafter known as Suzuki as applied to claims 1, 5 and 9-12 above.

The teaching of Suzuki as in the rejection above are relied upon.

Suzuki does not teach:

Suzuki does not provide an example of a compound of formula [I] in which at least five of $R_1 - R_6$ of formula [I] are replaced by fluorene substituent groups. However, Suzuki teaches that at least two substituent groups are needed in formula [I] and additionally provides fluorene as a preferred substituent.

It would have been obvious to one of ordinary skill in the art to select five or more fluorene groups as substituents $R_1 - R_6$ of formula [I] of Suzuki with the expectation of success

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in providing a compound suitable for use in the light-emitting layer of the light-emitting device of Suzuki.

Claims 1, 4, 5 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al., WO 03/007658 hereinafter known as Igarashi.

Igarashi teaches:

As to claims 1, 4, 5 and 8:

Page 2, line 23 through page 5, line 24, general formula (1) and (2), teach a central aromatic ring, which includes benzene, and which is additionally substituted with one or more condensed aryl groups, or condensed or uncondensed heteroaryl groups in which the substituents do not bond to each other to form a ring. Preferred substituents include naphthyl, phenanthryl, anthryl, fluoranthenyl, pyrenyl, and perylenyl groups.

Pages 20 through 30, compounds 1-1 through 1-95, present example compounds of formula (1). Compounds (1-51) and (1-67) meet the limitations of claims 1 and 5 of the instant invention. Additionally, the compounds provide examples of pyrene and fluoranthrene as required by claims 4 and 8.

As to claims 9-12:

Page 31, line 20 through page 32, line 3, teaches a light-emitting device which uses the compounds of formula (1) as a light-emitting material, host material, electron-injecting material, electron transport material, hole injection material, and/or hole transport material. The passage additionally teaches that the light-emitting device comprises a light-emitting layer and a plurality of layers between a positive and negative electrode.

The light-emitting layer or at least one of the plurality of layers comprises compounds of formula (1).

Igarashi provides only limited examples of compounds meeting the limitations of the instant invention. However, it would have been obvious to one of ordinary skill in the art to produce compounds of the instant invention based on the teachings of Igarashi as to the central ring structure and number of substituents coupled with the preferred substituents taught by Igarashi such as naphthyl, phenanthryl, anthryl, fluoranthenyl, pyrenyl, and perylenyl groups.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al., WO 03/007658 hereinafter known as Igarashi as applied to claims 1, 4, 5 and 8-12 above, and further in view of Hosokawa et al., US 6,515,182 hereinafter known as Hosokawa.

The teachings of Igarashi as in the rejection above are relied upon.

Igarashi teaches:

Page 32, lines 3-8, teach that compounds of formula (1) can be used in combination with other materials in the light-emitting layer. Additionally, compounds of formula (1) can be used as a host material.

Igarashi does not teach:

Igarashi does not teach the use of fluorenylene amines as components of the light-emitting layer.

Hosokawa teaches:

Column 2, line 44 through column 3, line 9, formula (1), teaches compounds useful in the light-emitting layer of an electroluminescent device. General formula (1) is equivalent to formula [VIII] of the instant invention when n equals one.

Column 25, line 45 through column 26, line 54, teaches that compounds of formula (1) can be used in combination with other materials in the light-emitting layer of an electroluminescent device as the light-emitting material or as a host material. Column 26, lines 35-54, teach that the compound of formula (1) can be used in combination with polycyclic compounds in the light-emitting layer. Examples of numerous polycyclic groups are presented.

Motivation to Combine:

Hosokawa teaches that compounds of his invention can be used in combination with various polycyclic compounds in the light-emitting layer. Various substituent groups provided by Igarashi are additionally taught by Hosokawa as examples of polycyclic compounds useful in combination with the compounds of his invention. It would have been obvious to one of ordinary skill in the art to incorporate the arylamine compounds of Hosokawa into the light-emitting layer of the device of Igarashi to improve the luminance and hole transporting property of the resulting device as taught by Hosokawa in column 2, lines 34-42.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al., WO 03/007658 hereinafter known as Igarashi as applied to claims 1, 4, 5 and 8-12 above, and further in view of Hosokawa et al., US 6,743,948 hereinafter known as Hosokawa '948.

The teachings of Igarashi as in the above rejection are relied upon.

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Igarashi does not teach:

Igarashi teaches:

Page 32, lines 3-8, teach that compounds of formula (1) can be used in combination with other materials in the light-emitting layer. Additionally, compounds of formula (1) can be used as a host material.

Igarashi does not teach:

Igarashi does not teach the use of fluorenylene amines as components of the light-emitting layer.

Hosokawa '948 teaches:

Column 2, lines 34-50, teach that compounds of formulae [1] and [3] through [10] are useful as light emitting materials in electroluminescent devices.

Column 6, lines 29-64, formula [10], teach compounds for use in an electroluminescent device in which Ar₂ is a divalent group and can be fluorene.

Column 18, lines 38-40, teach that example compounds (105) to (126) are examples of compounds of formula [10].

Column 77/78, compound 114, is an example of a compound of formula [10] which satisfies formula [IX] of the instant invention.

Column 91, lines 16-33, teach various polycyclic compounds which can be used in combination with compounds of formula [10] in the light emitting layer of an electroluminescent device.

Motivation to Combine:

Hosokawa '948 teaches that compounds of his invention can be used in combination with various polycyclic compounds in the light-emitting layer. Various substituent groups provided by Igarashi are additionally taught by Hosokawa '948 as examples of polycyclic compounds useful in combination with the compounds of his invention. It would have been obvious to one of ordinary skill in the art to incorporate the arylamine compounds of Hosokawa '948 into the light-emitting layer of the device of Igarashi to a highly efficient device having long device life as taught by Hosokawa '948 in column 2, lines 34-41.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2003/0039858.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is 571-272-6494. The examiner can normally be reached on Monday - Friday 6:00AM - 2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAC

**MARIE YAMNITZKY
PRIMARY EXAMINER**

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06/11/2007